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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,964	07/11/2003	Byung-Jin Chun	45442	2863

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ART UNIT	PAPER NUMBER
2685	

DATE MAILED: 01/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _11 July 2003_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-32_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-10 and 17-26_ is/are rejected.

7)☒ Claim(s) _11-16, 27-32_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _11 July 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

Detailed Action

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness
rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as
> set forth in section 102 of this title, if the differences between the subject matter sought to be
> patented and the prior art are such that the subject matter as a whole would have been obvious at
> the time the invention was made to a person having ordinary skill in the art to which said subject
> matter pertains. Patentability shall not be negatived by the manner in which the invention was
> made.

1. Claims 1-5, 8, 17-21, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Luz et al. (US 6,378,019 B1) in view of Schiemenz, Jr. et al. (US 5,834,972).

Regarding **claim 1**. Luz-'019B1 teaches a power pooling apparatus, for pooling the power

from amplifiers 525-523 [Fig. 5] for uniformly distributing sector loads [using level loading

amplifiers for different sector, abstract & col. 5, lines 28], in a mobile, cellular/wireless,

communication system [col. 2, line 6-7, col. 2, line 63], comprising:

a distributor [541] for distributing signals A1, B2, output from a signal generator

according to respective sectors [distributing signals A1, B2, such as from a signal generator

123, according to respective sectors 403, 405, abstract],

a radio signal processor [IFTM1 541, amplifiers 517, FTM1 503] for performing signal

processing to provide an output of the distributor to an antenna [processing output of

distributor 541 via amplifier 517 to sector antennas 403, 405]; and

Luz-'019B1 fails to teach the adaptive processor & characteristic matrix in below.

Schiemenz et al. (Schiemenz) teaches an adaptive signal processor [controller 128, Fig. 6]

for determining a characteristic matrix of the distributor [matrix 11] by using an output in a

predetermined position on a signal processing path of the radio signal processor [output at

106, 104, 132 to state sensor 126], and providing the characteristic matrix of the distributor

to the distributor [to reconfiguring the matrix in 116 with matrix 1 to matrix 5, col. 4, line 47

to col. 5, line 18 & col. 6, line 35 to col. 7, line 43, Fig. 9], in order to even out the effect of

loading due to a failure amplifier by redistributing signal at inputs for 116 [abstract].

Therefore, It would have been obvious to one of ordinary skill in the art at the time of

invention to upgrade, Luz-'019B1 with the reconfiguring of input matrix at distributor 116

from Schiemenz, in order to automatically remove the effect to the power dropping at a

sector antenna due to amplifier failure.

Regarding **claims 2, 18,** Luz-'19B1 teaches the power pooling apparatus & method above

[by routing different power level signal to different antenna position with no correlation, col.

6, lines 9-29]. Schiemenz teaches wherein the predetermined position on a signal

processing path of the radio signal is an output of a power amplifier [the state sensor 126

monitors the amplifier 104, associated with the reconfiguring of matrix 116, col. 4, line 44 to

col. 5, line 18].

Regarding **claims 3, 19,** Luz-'019B1 teaches the power pooling apparatus & method [col.

6,lines 9-29]. Schiemenz teaches the wherein the predetermined position on a signal

processing path of the radio signal is an output of a combiner [the predetermined position

132 monitored by state sensor 126 associated with the reconfiguring of matrix 116, col. 5,

line 44 to col. 5, line 18].

Regarding **claims 4, 20,** Luz-'019B1 teaches the power pooling apparatus & method [col. 6,

lines 9-29]. Schiemenz teaches the wherein the predetermined position on a signal

processing path of the radio signal is an output of the distributor [the predetermined position

106 monitored by state sensor 126 associated with the reconfiguring of matrix 116, col. 5,

line 44 to col. 5, line 18].

Regarding **claims 5, 21**, Luz-'019B1 teaches the power pooling apparatus & method [col.

6,lines 9-29]. Schiemenz teaches the wherein the adaptive signal processor updates the

characteristic matrix of the distributor by estimating a characteristic matrix [col. 5, line 44 to

col. 5, line 18] on the signal processing path in a predetermined position of the signal

processing path [positions at 106, 104,132 monitored by state sensor 126].

Regarding **claims 8, 24**. Luz-'019B1 teaches a power pooling apparatus & method [col.

6,lines 9-29]. Schiemenz teaches the wherein the radio signal processor [1 & 116 to 102 in

Fig. 6] comprises a power amplifier [104] for amplifying signals output from the distributor

[116]; and a combiner 102 for combining the amplified signals with signals [outputs from

amplifiers 104] which are power-amplified in the same type as the signals output from the

signal generator [outputs from 102 is corresponding to inputs, col. 3, lines 3-11].

Regarding **claim 17**. Luz-'019B1 teaches a power pooling method for uniformly distributing

sector loads [by routing different power level signal to different antenna position with no

correlation, to facilitating level loading, col. 6, lines 9-29] in a mobile, cellular/wireless,

communication system [col. 2, line 6-7, col. 2, line 63].

Luz-'019 fails to teach the comprising the steps of uniformly distributing signals output

from a signal generator according to respective sectors & further. Schiemenz teaches the

comprising the steps of uniformly distributing signals output from a signal generator

according to respective sectors [the input portions are re-distributed in 116, col. 4, line 25-

43, to uniform the effect of failed amplifier, steps 214-222, in Fig. 9];

performing radio signal processing on the distributed signals [performing radio signal

processing in 106, 104, 102 on the distributed signal A1-A4, Fig. 6] ; and determining a

characteristic matrix of a distributor by using an output in a predetermined position on a

radio signal processing path [the state sensor monitors postions ate 106, 104, 132 for re-

configuring the input matrix at 116, col. 4, lines 44 to col. 5, line 18 & steps 212-222 in Fig.

9], in order to even out the effect of loading due to a failure amplifier by redistributing signal

at inputs for 116 [abstract]. Therefore, It would have been obvious to one of ordinary skill in the art at the time of invention to upgrade, Luz-'019B1 with the error compensation from Luz-'355A1, in order to reduce the error.

2. Claims 6, 9-10, 22, 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luz-'019B1 in view of Schiemenz, as applied to claims 5 above, and further in view of Luz et al. (US 2003/0214,355 A1).

Regarding **claims 6, 22**. Luz-'019B1 & Schiemenz teach the power pooling apparatus & method above. Luz-'019B1 & Schiemenz fail to teach the wherein the characteristic matrix on the signal processing path is a <u>characteristic matrix of a power amplifier</u> existing on the signal processing path of the radio signal processor.

Luz-'355A1 teaches these features [the characteristic matrix of the power amplifier is characterized with the gain matrix Gcc in equation 9, G in equation 10, in order to correct the gain error in 330, via testing, paragraph 0067-0070, Fig. 3A-3B], in order to reduce the error with the compensation loop [0017]. Therefore, It would have been obvious to one of ordinary skill in the art at the time of invention to modify Luz-'019B1 with the reconfiguring

Regarding **claims 9, 25**. Luz-'019B1 & Schiemenz teach the power pooling apparatus, method above. Schiemenz teaches the wherein the radio signal processor [Fig. 6] further comprises a feedback path section [106-132 to state sensor 126 to controller 128 to matrix 116, Fig. 6] for forming a feedback path from the combiner and the adaptive signal processor [the feedback path from combiner 102, to adaptive processor, sensor 126 & controller 128].

Luz-'019 & Schiemenz fail to teach the converting an output signal of the power amplifier and an output signal of the combiner into baseband signals. Luz-'355 teaches the converting

an output signal of the power amplifier [A1-A4 outputs at 396, Fig. 3B] and an output signal of the combiner [396 output to receiving 397] into baseband signals [the baseband signal in demodulator 393, Fig. 3B, paragraph 0025], using the same reasoning for combing Luz-'0355 to Luz-'019 & Schiemenz.

Regarding **claims 10, 26**. Luz-'019B1 & Schiemenz teach the power pooling apparatus, method above. Schiemenz teaches the feedback path via 126, 128. Luz-'019 & Schiemenz fail to teach further features in below.

Luz-'355 teaches the wherein the radio signal processor [Fig. 3A, Fig. 3B] further comprises a calibrator [302, 303, Fig. 3A, Fig. 3B, paragraph 0024, 0017] estimating a transfer characteristic of the feedback path section [the characteristics Aci, Gci of the compensation control 395, Fig. 3B, Gci in paragraph 0067-0070 & Aci in paragraph 0099-0010] and

compensating output signals of the power amplifier [355-358 in Fig. 3A] and output signals of the combiner [381-384 in Fig. 3B, the output of combiner 360], using the reasoning for combing Luz-'0355 to Luz-'019 & Schiemenz.

3. Claims 7, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luz-'019B1 in view of Schiemenz, as applied to claim 5 above, and further in view of Dent et al. (US 5,574,967).

Regarding **claims 7, 23**, Luz-'019B1 & Schiemenz teach the power pooling apparatus, method above, but fail to teach the wherein the characteristic matrix on the signal processing path is a <u>characteristic matrix of a combiner</u> existing on the signal processing path of the radio signal processor. Dent et al. (Dent) teaches these features [the matrix for Cij is the characteristic matrix of a combiner 80, Fig. 6, Fig. 7, col. 9, line 40 to col. 11, line

51], in order to reduce distortion by correcting the error value [col. 11, lines 24-40]. It would

have been obvious to one of ordinary skill in the art at the time of invention to upgrade Luz-

'019 & Schiemenz with Dent's matrix Cij, in order to reduce the distortion of the amplified

signal from a power amplifier.

Claims Objection

4. Claims 11-16, 27-32 are objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form including all of the limitations of the base

claim and any intervening claims. The cited prior arts fail to teach the <u>multiplexing</u>

input/output of the <u>combiner and calibration</u> test signal with the frequency <u>down conversion</u>

into base band signals [claim 11, 27];

the signal processor comprising a <u>memory, a calibration calculator, an estimation matrix</u>

<u>calculator, a control matrix calculator, a delay</u> for delaying an output of control matrix

calculator [claims 12, 28]; and further limited with the features,

the calculating <u>next characteristic matrix of distributor, the calculating matrix using a</u>

<u>recursive least squares method RLS</u> [claims 13, 29]; and further limited with the feature,

the RLS method for estimating matrix for power amplifier [claims 14, 30]; the <u>RLS</u>

<u>method for estimating matrix for combiner</u> [claims 15, 31]; the <u>RLS method for estimating a</u>

<u>next matrix for distributor</u> [claims 16, 32].

The prior arts, failed to teach the above features, are Luz-'019 B1, Schiemenz-'972,

Dent-'967, Luz-'355 A1 above, and others, Arntz (US 5,646,631), Gans et al (US 5,604,462,

Fig. 5, Fig. 11-12), Wright et al. (US 6,342, 810 B1, Fig. 33A-34B, col. 34, lines 38-55, col.

18, line 61 to col. 19, line 3), Reudink et al. (US 5,955,920), Butler et al. (US 6,243,038B1),

Chesarek et al. (US 5,917,371), Rowland (US 6,006,111), Larkin (US 6,381,212 B1),

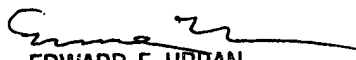Thompson (US 5,966,048), Meredith (US 5,790,517).

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Charles Chow whose telephone number is (571) 272-7889. The

examiner can normally be reached on 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Edward Urban can be reached on (571) 272-7899. The fax phone number for the

organization where this application or proceeding is assigned is (571) 273-8300. Information

regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be

obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles Chow C.C₁

January 12, 2006.

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